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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,550	02/11/2002	Gabriela Brasc	Z&P-INFN10176	5088

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LERNER AND GREENBERG, P.A.  
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EXAMINER

DEO, DUY VU NGUYEN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 01/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/073,550

Applicant(s)

BRASE ET AL.

Examiner

DuyVu n Deo

Art Unit

1765

ab

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet.  
37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 5, 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Havemann et al. (US 6,358,849).

Havemann describes a dual damascene patterning process comprising: providing a semiconductor structure with functional elements formed in a substrate (figure 1g); a dielectric, 170 or 172, disposed on the substrate (col. 3, line 59-65); a photoresist etching mask above the dielectric (col. 4, line 1-3); a silicon oxynitride ARC layer 173 (claimed a polymer intermediate

layer) between the photoresist and the dielectric layer (col. 3, line 66-67); etching the dielectric and the polymer intermediate for the dual damascene patterning using gas including CF<sub>4</sub> (claimed CF<sub>4</sub> ARC open process) (col. 3, line 25-27; col. 4, line 6, 7). Havemann's etching of the ARC and the dielectric would provide a high selectivity with respect to the photoresist since it uses the same gases (CHF<sub>3</sub>, CF<sub>4</sub>, O<sub>2</sub>, and Ar) as that of the claim and the photoresist is still on the substrate after the etch due to the fact that the photoresist is not removed until after the etch (col. 4, line 7).

Referring to claim 2, the dielectric is a fluorinated silicon dioxide or various silicon dioxide based dielectrics including nonfluorinated oxide (col. 3, line 63; col. 4, line 49-54). These materials would read on claimed oxide layer.

Referring to claim 5, the etching step above would have to be plasma etch (col. 3, line 25-27; col. 4, line 24).

Referring to claim 7, the etchant further includes CHF<sub>3</sub> (col. 3, line 25-27).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 4, 6, 8, 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Havemann as applied to claims 1 above, and further in view of Khajehnouri et al. (US 6,117,786).

Referring to claims 3, 4, 6, 8, 9, 10, 12, 13, 14, Havemann doesn't describes the processing parameters including etching time, flow rate of gases, and RF power. However, these are result-effective variables as shown here by Khajehnouri (tables 1, 3-10). Khajehnouri shows that processing parameters for etching must be determined through test runs. Therefore, it would have been obvious for one skill in the art at the time of the invention to determine the processing parameters including etching time, flow rate of gases, and RF power through test runs in order to obtain optimum processing parameters for the etching of the ARC and oxide with a reasonable expectation of success.

#### ***Response to Arguments***

5. Applicant's arguments filed 10/31/03 have been fully considered but they are not persuasive.

Referring to applicant's argument that Havemann's SiON-ARC is not claimed polymer ARC but is an inorganic ARC, as defined in page 5 of the specification, "...an intermediate layer made of a polymer, i.e. an ARC polymer as antireflection layer... Antireflection layers of this type may comprise organic or inorganic materials." Therefore, Havemann's SiON-ARC would read on claimed polymer intermediate layer. Also, he teaches of using CF<sub>4</sub> to etch the dielectric and the SiON. This etching process would read on claimed CF<sub>4</sub> ARC open process since the same gas is used in both processes.

#### ***Conclusion***

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n Deo whose telephone number is 703-305-0515.

DVD  
12/23/03



ROBERT KUNEMUND  
PRIMARY EXAMINER